AUTODESK UNIVERSITY

Laying the Groundwork in Revit for the Best MEP Data Platform

BES501955

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Software Engineer | Mechanical Engineer
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About the Presenter

- Jacob Elliott – Software Engineer
  - B.S. Petroleum Engineering, Colorado School of Mines
  - Mechanical engineer EI converted to software 2020
  - Focus on two areas:
    - Revit tools for design and drafting automation
    - Web-based dashboards for external clients
- Cator, Ruma and Associates
  - Lakewood, CO (Denver)
  - Full-service MEP firm
  - 100+ people
  - Healthcare, higher education, K-12

CATOR | RUMA
& ASSOCIATES, CO.

Learning Objectives

Objective 1	Link mechanical and electrical elements in a Revit model.
Objective 2	Leverage the Revit API to improve coordination of mechanical and electrical systems
Objective 3	Move coordination workflows into Revit from other platforms
Objective 4	Extend a custom coordination platform to use Autodesk Forge and Power BI

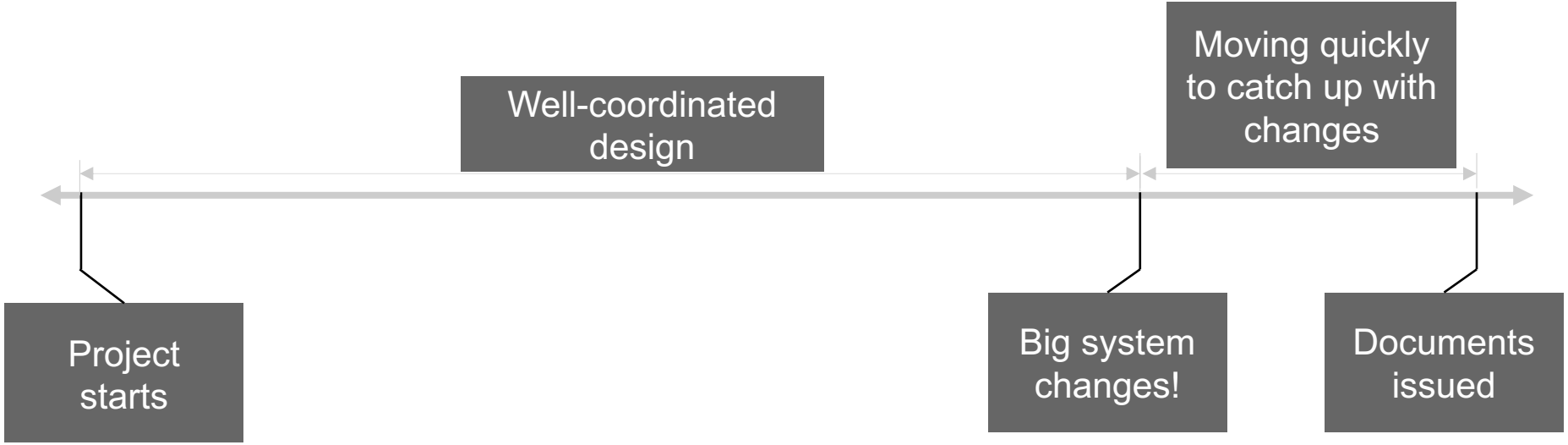
Outline

- The problem: Moving quickly and staying coordinated
- The solution: Coordination Hub
- User experience
- Addin architecture
- Forge + Power BI integration

The Need for Speed

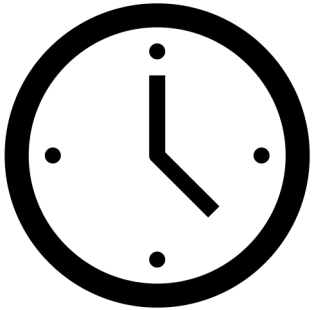
- BIM and Revit have enabled design processes to speed up
  - Frequent iteration from other disciplines (Architects, Structural Engineers, etc)
  - Owner requests and changes
  - Live model updates and real-time collaboration
  - Compressed schedules
- In many ways – great changes
- Everybody moving faster → mistakes more likely

Sound Familiar?

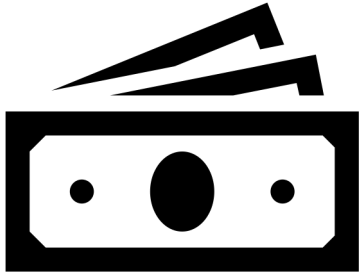


Sound Familiar?

- A few instances don’t get coordinated
  - Pump reselected at wrong voltage? → RFI/Change order
  - Air handler needs an extra circuit? → RFI/Change order
  - Air handler didn’t come with VFDs? → RFI/Change order
  - Last-minute electric unit heater addition? → RFI/Change order



- Why does this matter?
  - Time and money spent
  - Relationships (internal and external)
  - Design quality



Previous Solutions

Excel Spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	Project:								Project Phase (SD/DD/CD/etc.)				Date		By:
2															
3	Job #:														
4															
5	1. Provide a marked up 11x17 plan drawing indicating equipment locations														
6	2. Provide catalog cutsheets on equipment to electrical for coordination (including VFDs, not including pumps)														
7	3. All equipment with electrical connections must have a distinct designation														
8	**Plumbing**														
9			POWER				DISCONNECT				SEPARATE 120V CONNECTION				
10	EQUIP. DESIG.	EQUIPMENT DESCRIPTION	HP	kW	FLA	V/ph	VFD	FURNISHED WITH EQUIPMENT	EM POWER	SINGLE POINT CONNECTION	CONTROLS	HEAT TAPE	LIGHTING	RECEPTACLE	REMARKS
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															
21															
22															
23															
24															
25															
26															
27															

Revit Schedule

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
MECHANICAL EQUIP. DESIG.		PLUMBING FIXTURE				CUT			POWER				DISCONNECT		DUCT
NAME	NO.		EQUIPMENT DESCRIPTION	AREA SERVED	LEVEL	SHEET	HP	kW	FLA	V	PH	VFD	FURNISHED WIT	EM POWER	DETECTOR
ESP-P12	0-001		SUMP PUMP		BASEMENT LEVEL	☑	2	0 W	0 A	460 V	3	☑	☑	☑	
ESP-P12	0-002		SUMP PUMP		BASEMENT LEVEL	☑	1.5	0 W	0 A	460 V	3	☑	☑	☑	
FSD	240		FIRE SMOKE DAMPER		BASEMENT LEVEL										
PSE-P12	0-001		SUMP PUMP		BASEMENT LEVEL	☑	1.5	0 W	0 A	460 V	3	☑	☑	☑	
SE-P12	0-001		SUMP PUMP		BASEMENT LEVEL	☑	5	0 W	0 A	460 V	3	☑	☑	☑	
BASEMENT LEVEL: 5															
CH-P12	M-001		HYDRONIC PUMP		INTERSTITIAL LEVEL	☑	50	0 W	0 A	460 V	3	☑	☑	☑	
CH-P12	M-002		HYDRONIC PUMP		INTERSTITIAL LEVEL	☑	50	0 W	0 A	460 V	3	☑	☑	☑	
DCP-P12	M-001		DOMESTIC BOOSTER PUMP		INTERSTITIAL LEVEL	☑	0	0 W	0 A	115 V	1	☑	☑	☑	
DW-P12	M-001		DOMESTIC BOOSTER PUMP		INTERSTITIAL LEVEL	☑	5	0 W	0 A	460 V	3	☑	☑	☑	
ESP-P12	M-001		SUMP PUMP		INTERSTITIAL LEVEL	☑	5	0 W	0 A	460 V	3	☑	☑	☑	
ESP-P12	M-002		SUMP PUMP		INTERSTITIAL LEVEL	☑	1.5	0 W	0 A	460 V	3	☑	☑	☑	
FCU-P12	M-001		FAN COIL UNIT	INTERSTITIAL MECH RM	INTERSTITIAL LEVEL	☑	1	0 W	0 A	120 V	1		☑	☑	
FCU-P12	M-002		FAN COIL UNIT	INTERSTITIAL MECH RM	INTERSTITIAL LEVEL	☑	1	0 W	0 A	120 V	1		☑	☑	
FCU-P12	M-003		FAN COIL UNIT	INTERSTITIAL ELEV CNTRL	INTERSTITIAL LEVEL	☑	0	0 W	0 A	120 V	1		☑	☑	
FCU-P12	M-004		FAN COIL UNIT	INTERSTITAL ELE P12-1M16E	INTERSTITIAL LEVEL	☑	0	0 W	0 A	120 V	1		☑	☑	
FCU-P12	M-005		FAN COIL UNIT	INTERSTITIAL P12-1M17	INTERSTITIAL LEVEL	☑	0	0 W	0 A	120 V	1		☑	☑	
HW-P12	M-001		HYDRONIC PUMP		INTERSTITIAL LEVEL	☑	40	0 W	0 A	460 V	3	☑	☑	☑	
HW-P12	M-002		HYDRONIC PUMP		INTERSTITIAL LEVEL	☑	40	0 W	0 A	460 V	3	☑	☑	☑	
HX-P12	M-001		SHELL AND TUBE STEAM WATER HEAT EXCHAN		INTERSTITIAL LEVEL					0 V	0				
HX-P12	M-002		SHELL AND TUBE STEAM WATER HEAT EXCHAN		INTERSTITIAL LEVEL					0 V	0				
INTERSTITIAL LEVEL: 15															
	449	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	520	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	521	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	683	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	687	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	688	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	690	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	691	EWC-1	ELECTRIC WATER COOLER		LEVEL 1	☑	0	0 W	0 A	208 V	0		☑	☐	
	775	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	813	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	823	L-2	LAVATORY		LEVEL 1	☑	0	0 W	0 A	120 V	1				
	1041	BFS-2	BOTTLE FILLING STATION		LEVEL 1	☑	0	0 W	0 A	208 V	0		☑	☐	
CUH-P12	01-001		HYDRONIC CABINET UNIT HEATER		LEVEL 1	☑	90975.3	0 W	0 A	120 V	1		☑	☑	
CUH-P12	01-002		HYDRONIC CABINET UNIT HEATER		LEVEL 1	☑	119311.	0 W	0 A	120 V	1		☑	☑	
CUH-P12	01-003		HYDRONIC CABINET UNIT HEATER		LEVEL 1	☑	119311.	0 W	0 A	120 V	1		☑	☑	
CUH-P12	01-004		HYDRONIC CABINET UNIT HEATER		LEVEL 1	☑	90975.3	0 W	0 A	120 V	1		☑	☑	
CUH-P12	01-005		HYDRONIC CABINET UNIT HEATER		LEVEL 1	☑	90975.3	0 W	0 A	120 V	1		☑	☑	
CUH-P12	01-006		HYDRONIC CABINET UNIT HEATER		LEVEL 1	☑	90975.3	0 W	0 A	120 V	1		☑	☑	

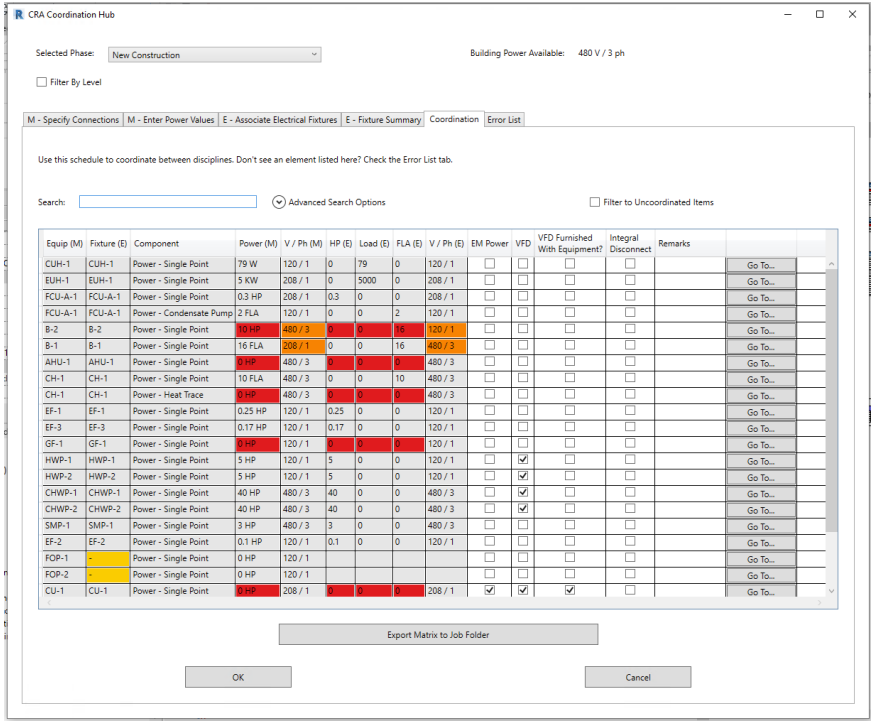
Cator Ruma’s Current Solution

- Custom software for in-house use
  - The “information” part of BIM is there for a reason
  - Ditch static spreadsheets – Use the data directly from Revit instead
  - Quality and efficiency (while maintaining workflows)
- In conjunction with other solutions
  - Frequent, open communication
  - Reasonable deadlines

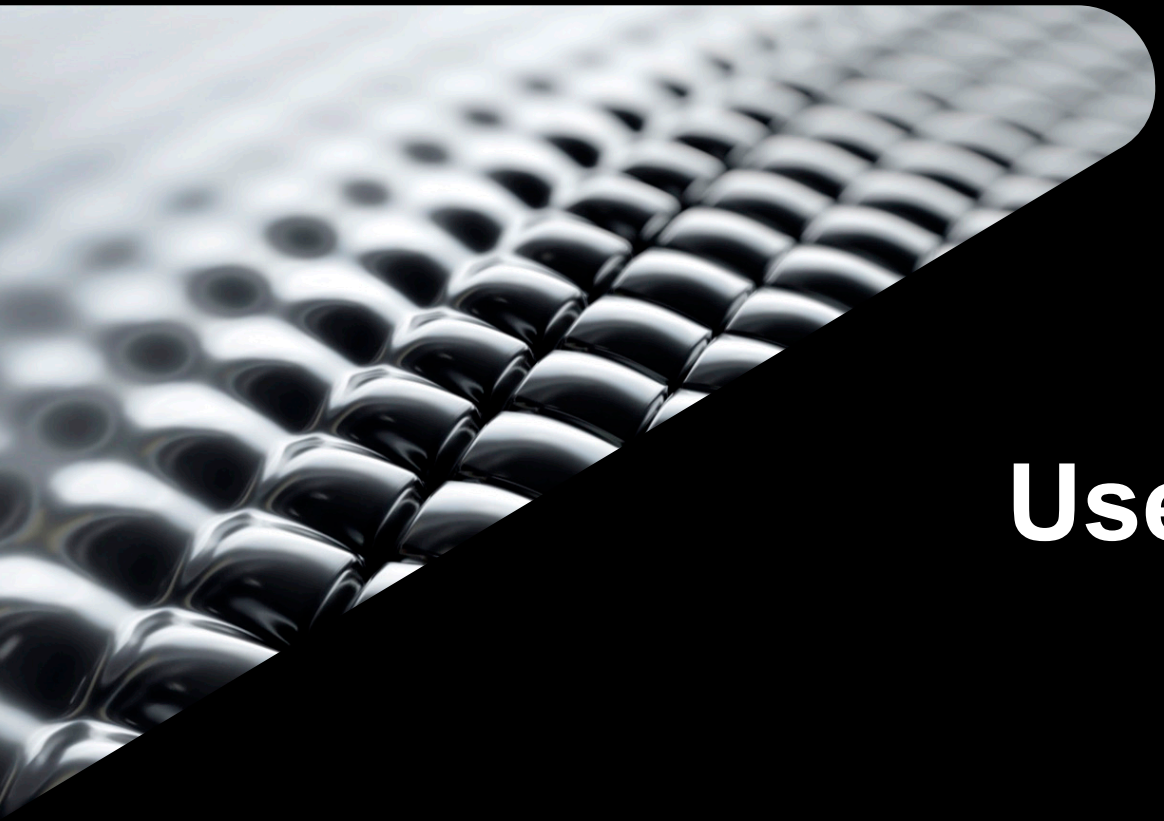
Coordination Hub

Our solution for comparing live data directly in Revit

- An interface to directly compare scheduled values from mechanical and electrical families
- Electrical fixtures tied directly to a “point of connection” on an instance of mechanical equipment
- Flags mismatched data in real time
- Parameters for commonly missed coordination items
- IMPORTANT – each discipline maintains their own data



Equip (M)	Fixture (E)	Component	Power (M)	V / Ph (M)	HP (E)	Load (E)	FLA (E)	V / Ph (E)	EM Power	VFD	VFD Furnished With Equipment?	Integral Disconnect	Remarks	
CUH-1	CUH-1	Power - Single Point	79 W	120 / 1	0	79	0	120 / 1	☐	☐	☐	☐		Go To...
EUH-1	EUH-1	Power - Single Point	5 KW	208 / 1	0	5000	0	208 / 1	☐	☐	☐	☐		Go To...
FCU-A-1	FCU-A-1	Power - Single Point	0.3 HP	208 / 1	0.3	0	0	208 / 1	☐	☐	☐	☐		Go To...
FCU-A-1	FCU-A-1	Power - Condensate Pump	2 FLA	120 / 1	0	0	2	120 / 1	☐	☐	☐	☐		Go To...
B-2	B-2	Power - Single Point	10 HP	480 / 3	0	0	16	120 / 1	☐	☐	☐	☐		Go To...
B-1	B-1	Power - Single Point	16 FLA	208 / 1	0	0	16	480 / 3	☐	☐	☐	☐		Go To...
AHU-1	AHU-1	Power - Single Point	0 HP	480 / 3	0	0	0	480 / 3	☐	☐	☐	☐		Go To...
CH-1	CH-1	Power - Single Point	10 FLA	480 / 3	0	0	10	480 / 3	☐	☐	☐	☐		Go To...
CH-1	CH-1	Power - Heat Trace	0 HP	480 / 3	0	0	0	480 / 3	☐	☐	☐	☐		Go To...
EF-1	EF-1	Power - Single Point	0.25 HP	120 / 1	0.25	0	0	120 / 1	☐	☐	☐	☐		Go To...
EF-3	EF-3	Power - Single Point	0.17 HP	120 / 1	0.17	0	0	120 / 1	☐	☐	☐	☐		Go To...
GF-1	GF-1	Power - Single Point	0 HP	120 / 1	0	0	0	120 / 1	☐	☐	☐	☐		Go To...
HWP-1	HWP-1	Power - Single Point	5 HP	120 / 1	5	0	0	120 / 1	☐	☑	☐	☐		Go To...
HWP-2	HWP-2	Power - Single Point	5 HP	120 / 1	5	0	0	120 / 1	☐	☑	☐	☐		Go To...
CHWP-1	CHWP-1	Power - Single Point	40 HP	480 / 3	40	0	0	480 / 3	☐	☑	☐	☐		Go To...
CHWP-2	CHWP-2	Power - Single Point	40 HP	480 / 3	40	0	0	480 / 3	☐	☑	☐	☐		Go To...
SMP-1	SMP-1	Power - Single Point	3 HP	480 / 3	3	0	0	480 / 3	☐	☐	☐	☐		Go To...
EF-2	EF-2	Power - Single Point	0.1 HP	120 / 1	0.1	0	0	120 / 1	☐	☐	☐	☐		Go To...
FOP-1	-	Power - Single Point	0 HP	120 / 1					☐	☐	☐	☐		Go To...
FOP-2	-	Power - Single Point	0 HP	120 / 1					☐	☐	☐	☐		Go To...
CU-1	CU-1	Power - Single Point	0 HP	208 / 1	0	0	0	208 / 1	☑	☑	☑	☐		Go To...



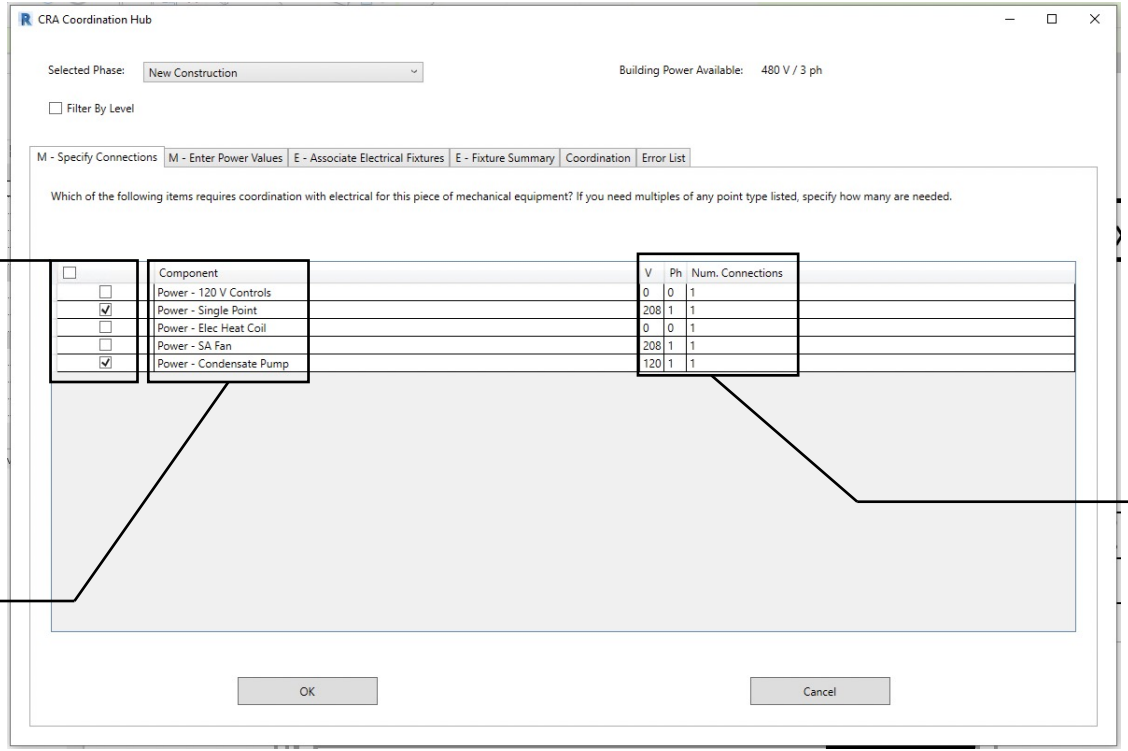
User Experience

The Coordination Process

Mechanical Process

Electrical Process

Mechanical – Specify Connections



Require coordination?

Point name

Power parameters

Place equipment → Basic coord. info (pop up) → Schedule power values → Cutsheets to electrical

Mechanical – Enter Power Values

CRA Coordination Hub

Selected Phase: New Construction

Building Power Available: 480 V / 3 ph

☐ Filter By Level

M - Specify Connections | M - Enter Power Values | E - Associate Electrical Fixtures | E - Fixture Summary | Coordination | Error List

Select any mechanical schedule from the left side to populate the relevant families on the right. Any values scheduled here will transfer to the relevant printed mechanical schedule.

NOTE For components specified with multiple connections (e.g., SA fan, RA fan), enter the TOTAL power value in the cell. If you have (4) fans at 10 HP, enter 40 HP in the cell. this will enter it in the correct cell on the mechanical schedule.

☐ Hide Instance Column ☑ Hide Unused Schedules Search: Advanced Search Options

- M - AHU (All Types) PART 1
- M - AHU (All Types) PART 2
- M - Air Separator
- M - Baseboard Radiation (Hydronic)
- M - Boiler (Condensing)
- M - Boiler (Non-Condensing)
- M - Cabinet Unit Heater (Hydronic)
- M - Chiller (Air-Cooled)
- M - Ductless Split Indoor
- M - Ductless Split Outdoor
- M - Expansion Tank (Hydronic)
- M - Fan
- M - Fan Coil Unit (All Types)
- M - Fuel Tank
- M - HX (Plate & Frame)
- M - Louver
- M - Pump
- M - Terminal Box (***) - HW
- M - Unit Heater (Electric)
- P - Dom Hot Water Storage Tank

Type Name	Instances	Single Point Connection	Single Point Value	Single Point Unit	Single Point Volt	Single Point Phase	Single Point Quantity	SA Fan Connection	SA Fan Value	SA Fan Unit	SA Fan Volt
FCU	FCU-A-1	☑	0.3	HP	208	1	1	☐	0	HP	208
FCU B	FCU-B-1	☑	0.5	HP	408	3	1	☐	0	HP	208

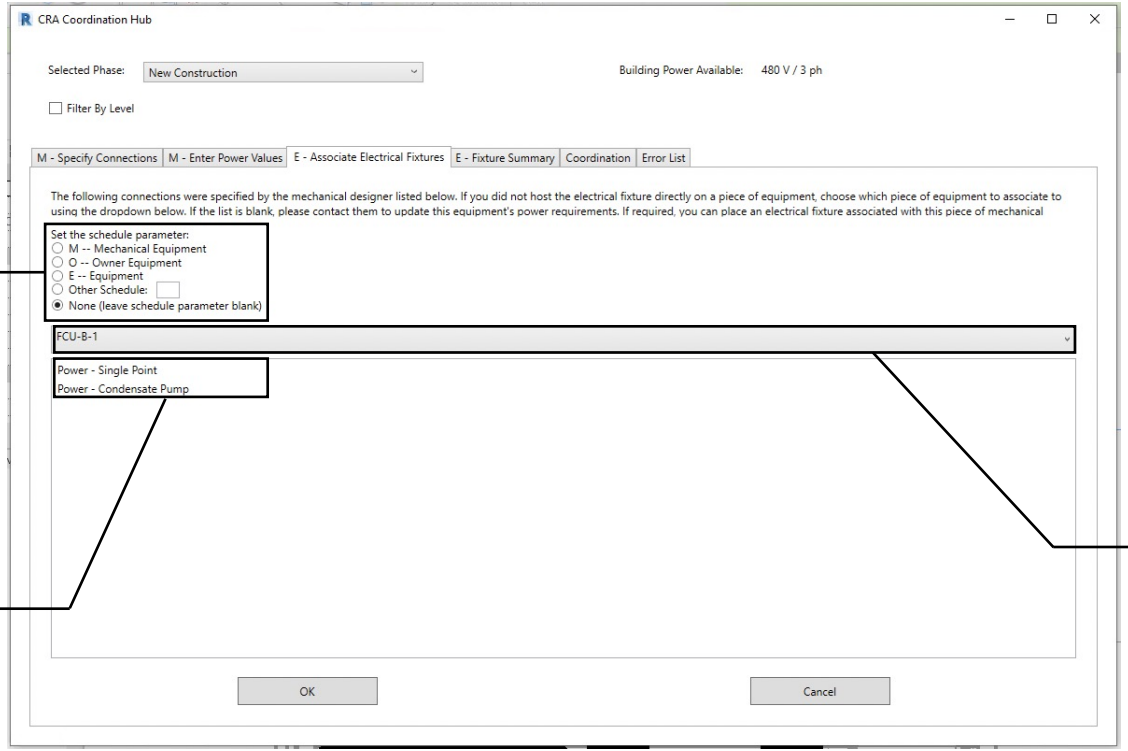
OK | Cancel

(6) parameters per point of connection

Select schedule

Place equipment → Basic coord. info (pop up) → Schedule power values → Cutsheets to electrical

Electrical – Associate Electrical Fixtures



Schedule parameter

Associate connection point

Associate equipment

Place fixtures → Basic coord. info (pop up) → Fill out schedules → Review Cutsheets

Electrical – Fixture Summary

Compare designations

Power values

Associate connection point

CRA Coordination Hub

Selected Phase: New Construction

Building Power Available: 480 V / 3 ph

Filter By Level

M - Specify Connections | M - Enter Power Values | E - Associate Electrical Fixtures | E - Fixture Summary | Coordination | Error List

This is a list of all SCHEDULED electrical fixtures in the model. Don't see an element listed here? Check the Error List tab.

Search: Advanced Search Options

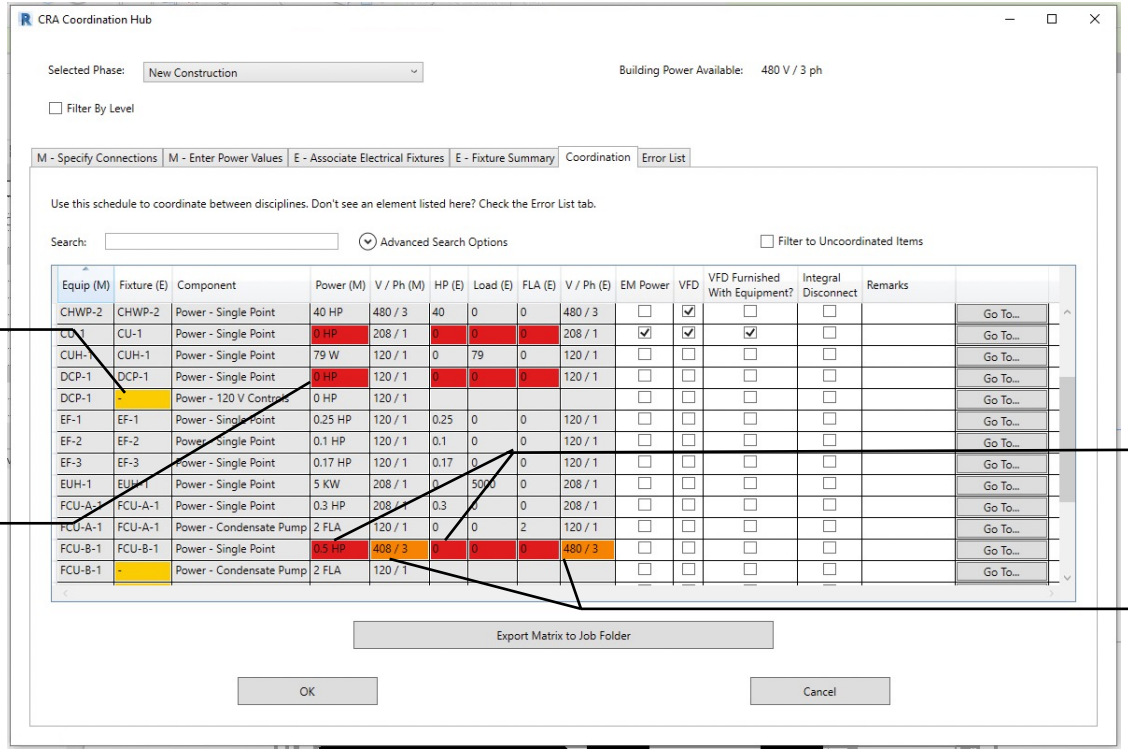
Equip. Type	No.	Assoc. Equip	Cxn Point(s)	Item Description	HP	FLA	Load	V	Ph	Elec Fixture Type	Ci	Pa	Sc
DCP	1	DCP-1	Single Point	DOMESTIC COLD WATER PUMP	0	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	28	L1	M
EF	3	EF-3	Single Point	EXHAUST FAN	0.17	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	32	L1	M
EF	1	EF-1	Single Point	EXHAUST FAN	0.25	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	34	L1	M
EF	2	EF-2	Single Point	EXHAUST FAN	0.1	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	32	L1	M
EUH	1	EUH-1	Single Point	ELECTRIC UNIT HEATER	0	0	5000	208	1	F EP-Disconnect Switches: 208V 1ph	24	L1	M
FCU-A	1	FCU-A-1	Single Point	FAN COIL UNIT CONDENSATE PUMP	0.3	0	0	208	1	F EP-Disconnect Switches: 208V 1ph	18	L1	M
FCU-A	1	FCU-A-1	Condensate Pump	FAN COIL UNIT	0	2	0	120	1	F EP-Disconnect Switches: 120V 1ph	22	L1	M
FCU-B	1	FCU-B-1	Single Point	FAN COIL UNIT	0	0	0	480	3	F EP-Disconnect Switches: 480V 3ph			M
GF	1	GF-1	Single Point	GLYCOL FEEDER	0	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	5	LE	M
HAND		None-None		HAND DRYER	0	0	0	120	1	F EP-Receptacle - Wall: 120-1 Jbox	10	L1	O
HAND		None-None		HAND DRYER	0	0	0	120	1	F EP-Receptacle - Wall: 120-1 Jbox	12	L1	O
HAND		None-None		HAND DRYER	0	0	0	120	1	F EP-Receptacle - Wall: 120-1 Jbox	9	L1	O
HAND		None-None		HAND DRYER	0	0	0	120	1	F EP-Receptacle - Wall: 120-1 Jbox	11	L1	O
HWP	1	HWP-1	Single Point	HEATING WATER PUMP	5	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	2	LE	M
HWP	2	HWP-2	Single Point	HEATING WATER PUMP	5	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	3	LE	M
SMP	1	SMP-1	Single Point	SNOWMELT PUMP	3	0	0	480	3	F EP-Disconnect Switches: 480V 3ph	13	HE	M
TV		None-None		TELEVISION	0	0	180	120	1	F EP-Receptacle - Wall: 120-1 Duplex	14	L1	O
WH	1	WH-1	Single Point	WATER HEATER	0	0	0	120	1	F EP-Disconnect Switches: 120V 1ph	30	L1	M

Update SELECTED Elec Equipment Type and No. Values

OK | Cancel

Place fixtures → Basic coord. info (pop up) → Fill out schedules → Review Cutsheets

Coordination Matrix



Equip (M)	Fixture (E)	Component	Power (M)	V / Ph (M)	HP (E)	Load (E)	FLA (E)	V / Ph (E)	EM Power	VFD	VFD Furnished With Equipment?	Integral Disconnect	Remarks	
CHWP-2	CHWP-2	Power - Single Point	40 HP	480 / 3	40	0	0	480 / 3	☐	☑	☐	☐		Go To...
CU-1	CU-1	Power - Single Point	0 HP	208 / 1	0	0	0	208 / 1	☑	☑	☑	☐		Go To...
CUH-1	CUH-1	Power - Single Point	79 W	120 / 1	0	79	0	120 / 1	☐	☐	☐	☐		Go To...
DCP-1	DCP-1	Power - Single Point	0 HP	120 / 1	0	0	0	120 / 1	☐	☐	☐	☐		Go To...
DCP-1	-	Power - 120 V Controls	0 HP	120 / 1					☐	☐	☐	☐		Go To...
EF-1	EF-1	Power - Single Point	0.25 HP	120 / 1	0.25	0	0	120 / 1	☐	☐	☐	☐		Go To...
EF-2	EF-2	Power - Single Point	0.1 HP	120 / 1	0.1	0	0	120 / 1	☐	☐	☐	☐		Go To...
EF-3	EF-3	Power - Single Point	0.17 HP	120 / 1	0.17	0	0	120 / 1	☐	☐	☐	☐		Go To...
EUH-1	EUH-1	Power - Single Point	5 KW	208 / 1	0	5000	0	208 / 1	☐	☐	☐	☐		Go To...
FCU-A-1	FCU-A-1	Power - Single Point	0.3 HP	208 / 1	0.3	0	0	208 / 1	☐	☐	☐	☐		Go To...
FCU-A-1	FCU-A-1	Power - Condensate Pump	2 FLA	120 / 1	0	0	2	120 / 1	☐	☐	☐	☐		Go To...
FCU-B-1	FCU-B-1	Power - Single Point	0.5 HP	408 / 3	0	0	0	480 / 3	☐	☐	☐	☐		Go To...
FCU-B-1	-	Power - Condensate Pump	2 FLA	120 / 1					☐	☐	☐	☐		Go To...

Unassociated electrical

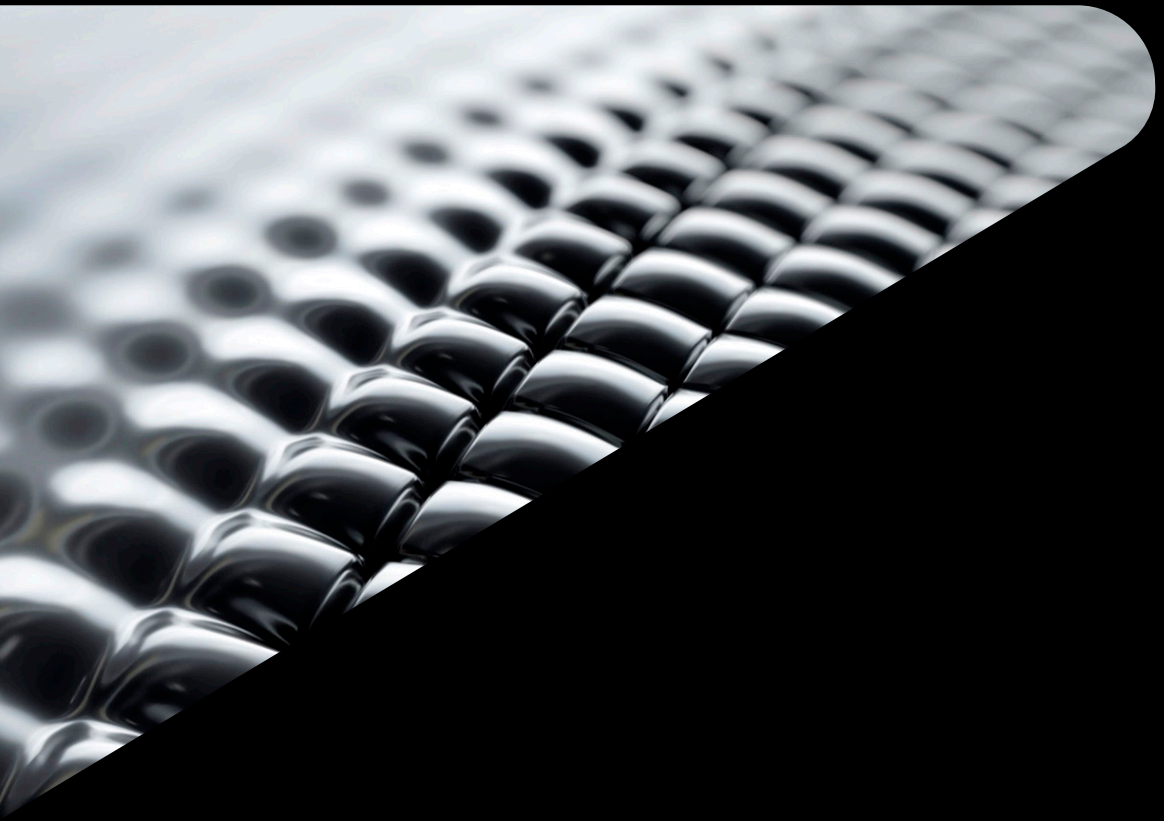
Missing power info from mech

Value mismatch

Voltage/ Phases Mismatch

Review coordination matrix

Iterate as needed

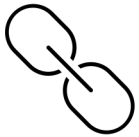


Addin Architecture

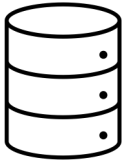
Key Components

Connecting interdisciplinary data

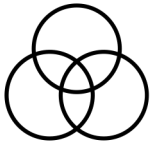
Standardize Power Parameters



Associate Elements



Monitor Equipment Additions to Database



Compare and Flag Values

Standardize Power Parameters

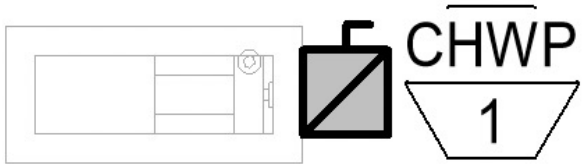
The critical (and very boring) first step

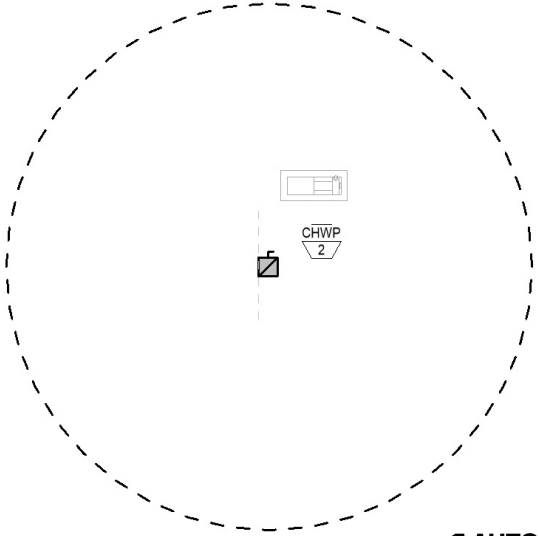
- Previous generations of our families had varying power parameters
- Required update to enable the tool to interact with them consistently
- BIM team and engineers “curated” list of all possible connections for each mechanical family
- Planning for every scenario means sometimes the list gets long
- Six parameters total for EACH connection:
  - Power - [parameter name] (Yes/No) — Power - SA Fan (Yes/No)
  - Power - [parameter name] Quantity — Power - SA Fan Quantity
  - Power - [parameter name] Voltage — Power - SA Fan Voltage
  - Power - [parameter name] Phases — Power - SA Fan Phases
  - Power - [parameter name] Value — Power - SA Fan Value
  - Power - [parameter name] Unit — Power - SA Fan Unit

Associate Elements (Part 1)

To Equipment Instance

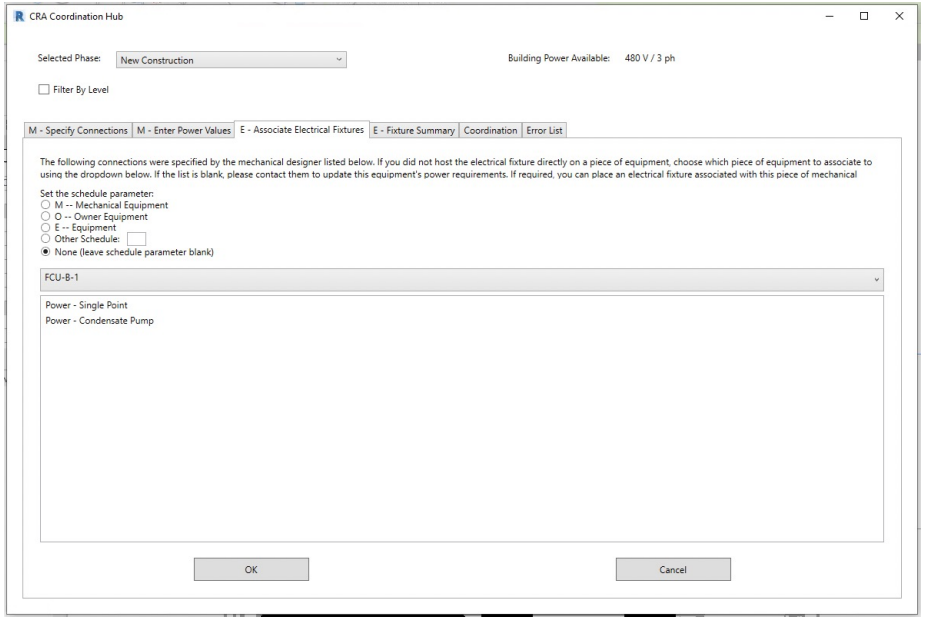
- Extension of an approach from Andrew Duncan (AU 2017)
- Created new shared parameter for storing Element ID of another element
- Populated in one of two ways:
  - Electrical fixture is hosted directly to mechanical equipment
    - → ID populates with that equipment's ID
  - Electrical fixture not hosted or hosted to another category
    - → Select from list of equipment within 20' radius





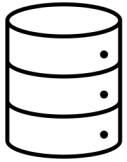
Associate Elements (Part 2)

To Specific Connection for that Equipment



- Created new shared parameter for storing comma-separated GUID list
- Populated after the equipment association is complete
- Populated in one of two ways:
  - Mech specifies single point of connection
    - → Connection is automatically selected
  - Mech specifies multiple points of connection
    - → Select one or more items from list

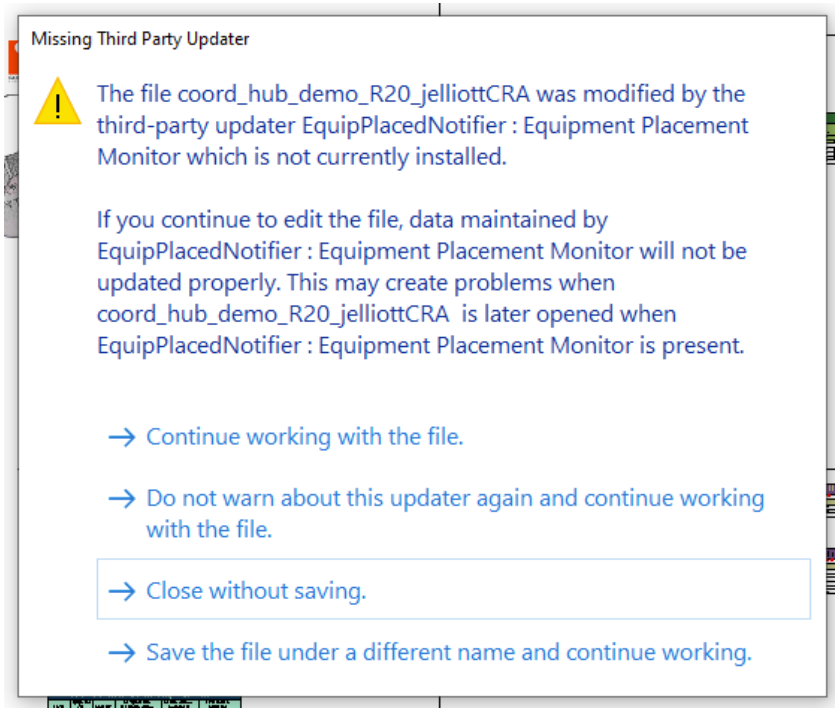
Monitor Equipment Additions to Database



- Several elements of this tool work best when they can be automatically triggered:
  - Picking required points of connection (mechanical)
  - Equipment association
  - Picking associated points of connection (electrical)
  - Defaulting electrical designation to match mechanical
- Requires implementation of the IUpdater class to monitor the database for added or updated elements
  - If added element(s) are mechanical equipment or certain electrical fixtures, run the coordination command
  - Modified elements are tracked too for use in specific situations

IUpdater Benefits and Drawbacks

- Benefits
  - Drives user engagement
  - Better understanding of expectations
  - Granular control of triggers
- Drawbacks
  - One more thing to load
  - Error if missing
  - Slight performance penalty (not noticeable to the user)

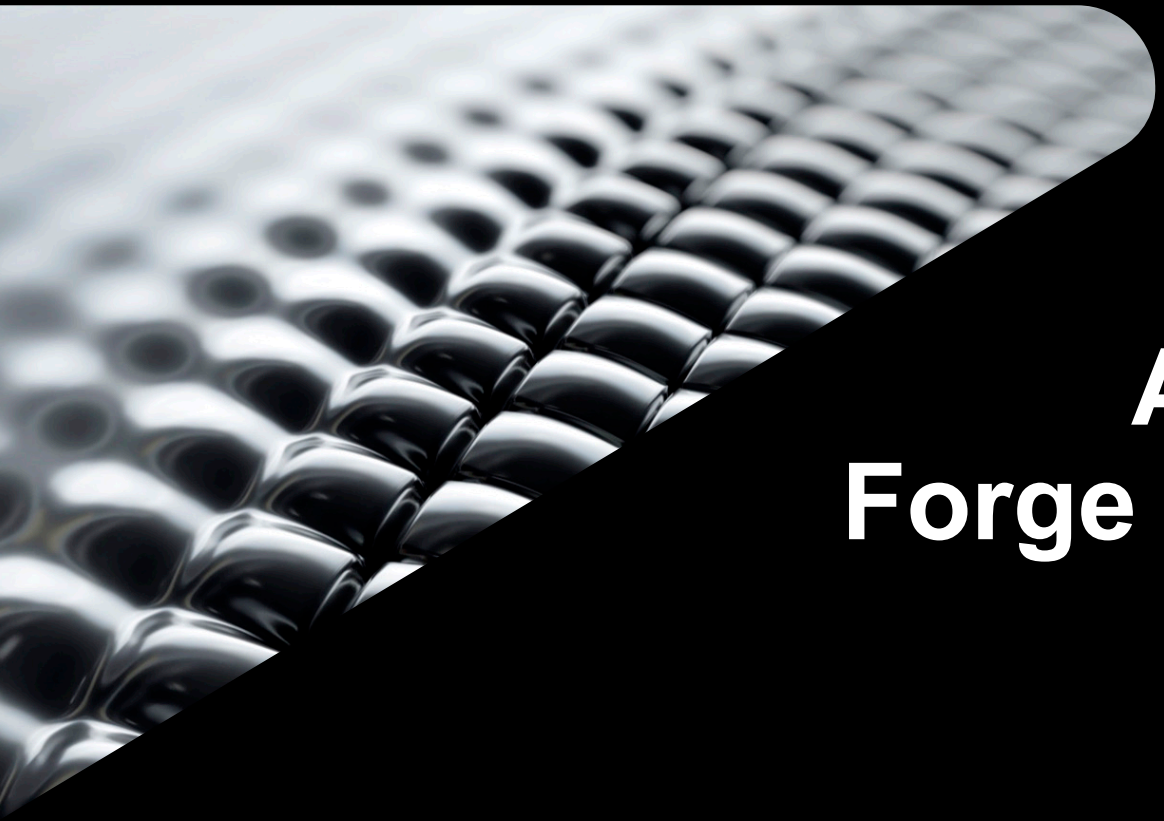


Compare and Flag Values

- All the work done in the other steps is to enable this comparison
- Flags inconsistencies in what the mechanical engineer and electrical engineer have designed
- Three items are called out with flags:
  - Missing associations
  - Mismatched voltage/phases
  - Mismatched power value
- Data can be exported to CSV

Challenges and Things to Consider

- Type vs Instance power parameters
- Safety factors and non-exact matches
- Family/parameter consistency
- Automatically running the tool without nuisance windows
- Worksharing and document modification
- Collaboration with engineers and software developers is key



Adventures in Forge and Power BI

Coordination Hub + Forge + Power BI

Original Approach

- Allow non-Revit users to view coordination data
- Export coordination data using Forge
- Visualize data in Power BI (or another data visualization platform)
- User can see coordination data for multiple projects in one place

Challenges

- Our BIM 360 models live on other accounts (hubs)
- Forge apps approved on account level
- Other companies must approve app account-wide
- Works well where models are on your own account
- Not scalable or practical for our situation

Coordination Hub + Revit Addin + Power BI

Modified Approach

- Forge app → Revit addin External Application
- Same logic as Forge process, minimal code changes
- “Crowd sourced” data export
  - Max export once per hour (check for multiple people)
  - If anyone is editing model, export occurs
  - Potential issue – nobody in model means no export
  - Note on dashboard last export time for transparency
- Platform agnostic – BIM 360, Revit Server, on-premises servers, etc

Data Flow

Get Revit data

Use Revit addin to retrieve the power coordination information from Revit models.

Process Revit Data

Check the data for coordination issues. Add flags as required.

Visualize

Pass processed data to a dashboard. Easy overview for all user's projects.

Coordinate

Communicate with team and make updates as required.

Power BI Dashboard

Proof of Concept

Project Number	Project Name	Coordination Metric
2022001	Project 1	69%
2022002	Project 2	63%
2022003	Project 3	85%

Equip (M)	Fixture (E)	V /ph (M)	Power Value (M)	Power Unit (M)	V /ph (E)	HP (E)	FLA (E)	Load (E)	Integral Disconnect	VFD Furnished With Equip	VFD Required	EM Power	Coord Remarks
AHU-1	AHU-1	480 V / 3 ph	0.00	HP	480 V / 3 ph	0.00	0	0	False	False	False	False	
B-1	B-1	208 V / 1 ph	16.00	FLA	480 V / 3 ph	0.00	16	0	False	False	False	False	
B-2	B-2	480 V / 3 ph	10.00	HP	120 V / 1 ph	0.00	16	0	False	False	False	False	
CH-1	CH-1	480 V / 3 ph	10.00	FLA	480 V / 3 ph	0.00	10	0	False	False	False	False	
CH-1	CH-1	480 V / 3 ph	0.00	HP	480 V / 3 ph	0.00	0	0	False	False	False	False	
CHWP-1	CHWP-1	480 V / 3 ph	40.00	HP	480 V / 3 ph	40.00	0	0	False	False	True	False	
CHWP-2	CHWP-2	480 V / 3 ph	40.00	HP	480 V / 3 ph	40.00	0	0	False	False	True	False	
CU-1	CU-1	208 V / 1 ph	0.00	HP	208 V / 1 ph	0.00	0	0	False	True	True	True	
CUH-1	CUH-1	120 V / 1 ph	79.00	W	120 V / 1 ph	0.00	0	79	False	False	False	False	
DCP-1	-	120 V / 1 ph	0.00	HP	V / ph				False	False	False	False	
DCP-1	DCP-1	120 V / 1 ph	0.00	HP	120 V / 1 ph	0.00	0	0	False	False	False	False	
EF-1	EF-1	120 V / 1 ph	0.25	HP	120 V / 1 ph	0.25	0	0	False	False	False	False	
EF-2	EF-2	120 V / 1 ph	0.10	HP	120 V / 1 ph	0.10	0	0	False	False	False	False	
EF-3	EF-3	120 V / 1 ph	0.17	HP	120 V / 1 ph	0.17	0	0	False	False	False	False	
EUH-1	EUH-1	208 V / 1 ph	5.00	KW	208 V / 1 ph	0.00	0	5000	False	False	False	False	
FCU-A-1	FCU-A-1	120 V / 1 ph	2.00	FLA	120 V / 1 ph	0.00	2	0	False	False	False	False	
FCU-A-1	FCU-A-1	208 V / 1 ph	0.00	HP	208 V / 1 ph	0.30	0	0	False	False	False	False	
Total			**259.02**			**94.32**	**67**	**5079**					

A Simplified Process

- No need to maintain data in two places
- Opposite discipline always sees real, current data
- No last-minute coordination!
- Work faster, more efficiently
- Reduce RFIs and change orders

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